

by a national research committee consisting partly of representatives of the Post Office, Admiralty, War Office, and Treasury, and partly of paid members nominated for short terms of years by the Royal Society and the Institution of Electrical Engineers, together with the director of the National Physical Laboratory.

As the capital cost of the laboratory is estimated at only 7,300*l.*, and the total annual expense, both of laboratory and committee, at only 4,800*l.*, sums which are very small in comparison with the possible savings that such a research laboratory ought to be able to assist in effecting in the vast annual expenditure on the national telegraph service, the proposals cannot be considered in any way extravagant. Indeed, if anything, they appear to err on the side of insufficiency. For instance, the secretary of the proposed research committee, who, in addition to possessing the usual qualifications for such a post, including a knowledge of French and German, is to be a man of technical training and experience, is only to divide 300*l.* per annum between himself and a clerk. Again, the principal assistant, who must obviously be a first-class technician, as he is to have complete charge of the laboratory under the director of the National Physical Laboratory, is only to get a salary of 400*l.*

Further, it is suggested that the honorarium given to each of the paid members of the proposed committee for their attendance at meetings is to be fixed at ten guineas a meeting, it being proposed that during the first two years there will probably be fifteen meetings per annum, and after the first two years ten meetings. No doubt eminent men of science will be found ready to give their time to the State at this rate of remuneration, as equally would they no doubt be found to do so for nothing; but it may be pointed out that this amount of pay suggested for the committee, presumably for men of the highest scientific capacity and experience, is only about one-half what the average company director, who may have no special experience or training, commonly obtains for attending the board meetings of medium-sized companies in the City of London. The fact that Sir Alexander King, the secretary of the Post Office, and Mr. R. Wilkins, of the Treasury, are of opinion that the payments suggested are on too liberal a scale, is significant evidence of the low value that non-technical Government officials attach to scientific attainments.

However, the recommendations contained in the report, if adopted by the Government, will be a beginning in the right direction, and it is satisfactory to know that similar arrangements in connection with the advisory committee for aeronautics, established in 1909, of which the research work is carried out in the National Physical Laboratory, are working well. It will always be open to the research committee, when once it is established and has had time to prove the value of its work, to point out that with ampler resources it could do more.

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THE URGENT NEED FOR ANTHROPOLOGICAL INVESTIGATION.¹

THE Carnegie Institution of Washington has taken the wise step of inviting certain experts to report on the special needs of anthropological investigation, and have printed the reports of Dr. W. H. R. Rivers, F.R.S., Prof. A. E. Jenks, and Mr. S. G. Morley in a sumptuous *brochure*.

Dr. Rivers lays particular stress on the special urgency of the needs of anthropology, due to the character of its material, this factor of urgency being wholly or almost without importance in other branches of science. Only exceptionally can the investigation of archæological problems be regarded as urgent, and he believes that science will gain in the long run by delaying archæological exploration. He contrasts with this the case for ethnology, and adds, "In many parts of the world the death of every old man brings with it the loss of knowledge never to be replaced." He contrasts "survey work" with "intensive work," and proves the importance of the latter. The most favourable moment for ethnographical work among any given people is discussed, and the different kinds of agencies by which ethnographical work is now being carried out, his remarks on investigations by officials and missionaries being both just and sympathetic.

Preliminary training in scientific methods is essential, and Dr. Rivers agrees with Friederici that investigators working alone seem to obtain more valuable results than expeditions comprising a whole staff of experts. "The work of an expedition will attain its highest efficiency if it seeks to combine the advantages of individual enterprise with the work of specialists where this seems indispensable." Collecting expeditions for the enriching of museums rarely accumulate any intimate knowledge of the natives that is of much value; indeed their tendency is unconsciously in the opposite direction. Everything which the intensive worker obtains will have an infinitely wider and deeper meaning than anything which can be obtained by the cursory visitor, and the processes of manufacture can be collected, which are even more important than the finished article.

Physical anthropology can be postponed till a later stage of the inquiry. It follows that the prime need of anthropology is for the intensive investigation of those living examples of human culture which are most likely to disappear or suffer serious decay. Dr. Rivers then makes a brief survey of different regions of the globe outside America, with the object of ascertaining the urgency of the needs, and how far these needs are being met by existing agencies. "Perhaps the most urgent needs for Europe are for the study of the existing cultures of Lapland in the north, and of the countries of its south-eastern corner, and especially of Albania." The pressing need for research in South Africa "stands beyond all question." The ethnological problems of Asia, except

¹ Reports upon the Present Condition and Future Needs of the Science of Anthropology. Presented by W. H. R. Rivers, A. E. Jenks, and S. G. Morley. Pp. 91 + 14 plates. (Washington, D.C.: Carnegie Institution of Washington, 1914.)

perhaps in a few places, are regarded as presenting no special urgency. The same applies on the whole to Malaysia, where very little intensive work has been done as yet. Parts of New Guinea and the larger islands of Melanesia can well be left for the present, others require immediate investigation, as do all the smaller islands. "There is probably no part of the world where a larger amount of valuable material can be saved during the next few years than in Melanesia, and yet at the present moment little or nothing is being done." Much work and this of great urgency remains to be accomplished in Australia. "A thorough survey of Polynesia will yet provide material of the utmost value to the ethnologist." "In Micronesia the conditions are more satisfactory . . . but there still remain . . . islands, such as the Gilbert and Ellice Groups, about which our existing knowledge is trivial." He concludes by saying:

"Two regions, southern Africa and Oceania, combine an extreme degree of the urgency of their needs with very inadequate attempts to meet those needs. Of these regions it is suggested that Oceania should have the preference. It includes places where interesting and important examples of human culture are on the verge of extinction and other places which are in a condition especially suited for intensive work, so that a large mass of valuable material can be obtained with relative ease. Through its insular character Oceania presents conditions of especial importance in the study of certain theoretical problems, and it has a special interest in that its culture stands in close relation to that of the American continents. It is suggested that the study of a region allied in culture to that of America may react on the study of American ethnology, and may prove the best means of reaching positive conclusions concerning the exact nature of the indigenous culture of America."

Prof. Jenks gives a brief account of the subject-matter and present status of anthropology. In a section entitled "Research problems and opportunities in Anthropology," he deals solely with the Indo-Pacific and American areas. For the former he takes as his main theme the problem of the origin and spread of the Pacific islanders and their culture, and remarks that "Churchill recently has largely solved the Polynesia migration problem in the Pacific Ocean." He suggests that in Polynesia "a true knowledge of the genesis of the speech of man" possibly may be discovered, and quotes from Churchill that the Polynesian languages are of "the most elemental character," and the "parts of speech have but just begun to make their appearance." Churchill even says positively that "we find ourselves engaged with a language family in which we can discover the beginnings of human speech." These statements are very remarkable if it be true, as other linguists assert, that the Melanesian variants of the Austronesian languages exhibit more primitive features than the Polynesian (Codrington definitely states that the Polynesian group of languages is "late, simplified, and decayed" as compared with

the Melanesian), and if we are to look for the "primeval home" of the Polynesians in the Ganges Valley. One would like to have the evidence for Churchill's statement that "the Tongafiti migration has left absolutely no trace of its passage in Melanesia." Prof. Jenks refers to certain problems, such as the decay and loss of culture forms, and to prehistoric stone remains, and he recommends further excavations at Trinil for *Pithecanthropus erectus*, and a study of the individual and communal life of the orang-utan.

The antiquity and origin of man in America, and the origin and spread of aboriginal American culture are put forward as special questions requiring to be decided. The solution of the problem of the "extra-American origin of culture . . ." would contribute not only to the present subject, but to the anthropological world-problem of culture similarities—whether similar cultural expressions in isolated areas had a common origin, or independent origins, or are due to transmission." Three of the most important modern anthropological problems of the Western hemisphere and the Pacific islands, of which Prof. Jenks advocates the study, are ethnic heredity, influence of environment on mankind, and human amalgamation, and he proposes that a permanent laboratory should be established eventually in connection with these studies.

Mr. Sylvanus G. Morley makes a strong appeal in his beautifully illustrated essay for a prolonged and thorough investigation of the great group of ruins at Chichen Itza in northern Yucatan. It is his belief "that no other archæological field in the New World offers such rich promise as the region occupied by the ancient Maya, and, at the same time, no equally important field has been so inadequately studied."

The facts and arguments adduced by Dr. Rivers and Prof. Jenks point clearly to Oceania as being probably that part of the world which most urgently needs ethnographical investigation, and if the Carnegie Institution could see its way to organise a commission for the intensive study of as many portions of that area as possible, combined with an investigation of the more general problems of racial and cultural movements, it would confer an incalculable boon on all present and future students of the history of human culture. If this be not attempted very soon the opportunity will pass away for ever.

A. C. HADDON.

THE PRINCIPLE OF RELATIVITY.¹

II.

AT the root of what are generally thought of as our intuitive notions of space and time lies the conception of simultaneous instants at different points. The sensations by which we actually perceive bodies are, strictly speaking, not distributed through space; but the mental picture which we construct of the phenomena is ordered under the categories of time and space, and in

¹ Continued from p. 379.